

1 **WHAT IS CLAIMED IS:**

2 1. A packaging method for thin integrated circuits comprising:
3 forming a circuit layer with multiple sections on a substrate;
4 attaching at least one electronic element to the circuit layer to
5 connect two sections of the circuit layer;
6 applying an encapsulant layer to protect the electronic elements; and
7 removing the substrate to expose the circuit layer.

8 2. The packaging method as claimed in claim 1, wherein multiple
9 dimples are defined in the substrate before the circuit layer is formed on the
10 substrate and in the dimples;

11 whereby, the circuit layer at the dimples become protrusions after the
12 substrate is removed.

13 3. The packaging method as claimed in claim 1, wherein the
14 substrate has a flat top face and the circuit layer formed on the substrate is
15 flat.

16 4. The packaging method as claimed in claim 1, wherein the at least
17 one electronic element is connected to the circuit layer by bonding metal
18 wires between the at least one electronic element and the circuit layer.

19 5. The packaging method as claimed in claim 2, wherein the at least
20 one electronic element is connected to the circuit layer by bonding metal
21 wires between the at least one electronic element and the circuit layer.

22 6. The packaging method as claimed in claim 3, wherein the at least
23 one electronic element is connected to the circuit layer by bonding metal
24 wires between the at least one electronic element and the circuit layer.

1 7. The packaging method as claimed in claim 1, wherein the at least
2 one electronic element is connected to the circuit layer by tin balls between
3 the at least one electronic element and the circuit layer.

4 8. The packaging method as claimed in claim 2, wherein the at least
5 one electronic element is connected to the circuit layer by tin balls between
6 the at least one electronic element and the circuit layer.

7 9. The packaging method as claimed in claim 3, wherein at least one
8 the electronic element is connected to the circuit layer by tin balls between
9 the at least one electronic element and the circuit layer.

10 10. The packaging method as claimed in claim 1, wherein parts of
11 the substrate are retained after etching, are bent and serve as a gull-winged
12 lead frame.

13 11. The packaging method as claimed in claim 2, wherein parts of
14 the substrate are retained after etching, are bent and serve as a gull-winged
15 lead frame.

16 12. The packaging method as claimed in claim 3, wherein parts of
17 the substrate are retained after etching, are bent and serve as a gull-winged
18 lead frame.

19 13. The packaging method as claimed in claim 1, wherein an
20 isolating layer is applied between adjacent sections of the exposed circuit
21 layer after the substrate is removed, wherein the isolating layer reflects light.

22 14. The packaging method as claimed in claim 1, wherein the at least
23 one electronic element is a light emitting diode.

24 15. The packaging method as claimed in claim 14, wherein an

- 1 isolating layer is applied between adjacent sections of the exposed circuit
- 2 layer after the substrate is removed, wherein the isolating layer reflects light.

3 16. The packaging method as claimed in claim 1, wherein after
4 removing the substrate, the packaging method further comprises:

5 attaching at least one bottom electronic element under the exposed
6 circuit layer; and
7 applying a bottom encapsulant layer to protect the at least one
8 electronic element.